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ABSTRACT

The manual is the second of six student manuals for use in a course on occupational health and safety for supervisory personnel. The manual contains lessons 4 and 5 of the 15 consecutively-numbered lessons, each of which contains study questions (and answers) interwoven with the text and review questions at the end of each section. (Lesson 4 discusses the supervisor's role in eliminating injuries and illnesses in the workplace and covers techniques for identifying and correcting the hazardous acts and work conditions which cause accidents, the personal and job-related factors which contribute to occupational injuries, and the importance of exercising employer control to effectively prevent injuries and illness. Lesson 5 discusses procedures for investigating and reporting accidents and exposures to health hazards in the workplace, and covers the contents of the investigation report, recommendations for corrective action, and the use of the concepts of loss severity potential and probable recurrence rate in setting priorities for corrective action. (JR)

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A Programmed Instruction Course

PRINCIPLES AND PRACTICES OF OCCUPATIONAL SAFETY AND HEALTH

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STUDENT MANUAL

Booklet Two

U.S. DEPARTMENT OF LABOR
Occupational Safety and Health Administration
Washington, D.C. 20210

OSHA 2214

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LESSON 4

THE ROLE OF THE SUPERVISOR

The purpose of this lesson is to set forth the role of the supervisor in the elimination of injuries and illnesses in the workplace. The lesson presents techniques for identifying and correcting hazardous acts and conditions that cause accidents. Particular stress will be placed on employer control and the importance of job hazard analysis as a method of eliminating hazards.

IT RESTS ON YOUR SHOULDERS

In most establishments, a large part of the day-to-day responsibility for an effective injury and illness prevention and control program rests on the shoulders of the supervisor.

As you have learned in previous lessons, the purpose of the Williams-Steiger Safety and Health Act of 1970 is to assure safe and healthful working conditions for the men and women who comprise the American work force. To accomplish this goal, it is necessary for you to contribute effort and action to prevent injuries and illnesses in your business or industry. THE ACT MAKES EMPLOYERS RESPONSIBLE FOR JOB-RELATED INJURY AND ILLNESS PREVENTION AND CONTROL.

THE KEY PERSON

As a representative of the employer, YOU SHARE THAT RESPONSIBILITY. YOU are the KEY person in the line of defense against occupational injury and disease. YOU as a supervisor are the one who best knows the employees, equipment, and procedures performed in the workplace you supervise. You are also the one who best knows the safety and health hazards, if any, that exist there.

SOME OF YOUR FUNCTIONS

To help you with your responsibilities, this lesson will cover the fundamentals of occupational injury and illness PREVENTION and CONTROL. Some of the functions involved are:

- Keeping records
- Reporting occupational injuries and illnesses
- Investigating accidents and exposure to hazardous conditions
- Identifying and eliminating hazards
- Conducting inspections
- Communicating information to employees and employers
- Providing training for employees
- Assuring that employees use all required personal protective equipment

YOU ARE THE VITAL CONTACT POINT

One of the most vital functions you perform in your employer's injury and illness prevention and control program is that of being the contact point between your employer and the employees you supervise.

1. When your employer informs you about new safety and health policies and rules, the person who will communicate this information to your subordinates is:

    a. You as supervisor

    b. Your employer

2. When the employees you supervise tell you about their experience with the results of working under the employer's safety and health rules, or about suggestions they have for improving the rules, the communication upward to the employer should come from:

    a. The employees you supervise

    b. You as the supervisor

When communicating safety and health rules or other information to employees, you must make sure they understand how to apply the rules to their own jobs.

ELIMINATE OR MINIMIZE

Occupational injury and illness PREVENTION means *taking action to eliminate accidents or exposures to harmful substances in the work environment which can cause injury, illness, or death.* Injury and illness CONTROL means taking action to keep the undesirable effects of such events to a minimum.

BEFORE AN OCCUPATIONAL INJURY OR ILLNESS OCCURS OR DEVELOPS

3. The steps to keep occupational injuries and sicknesses from occurring or developing, as well as to minimize their severity are called injury and illness:

    a. Reaction

    b. Prevention and Control

CAUSES

The following discussion on hazardous acts and conditions and immediate and basic causes of accidents will help you in your prevention and control program.

When accidents or exposure to harmful factors on the job result in injuries or illnesses, these undesirable events have CAUSES as well as consequences. Finding the causes is necessary to prevent and control injuries and illnesses.

HAZARDOUS ACTS AND CONDITIONS AS IMMEDIATE CAUSES

OCCUPATIONAL INJURIES AND ILLNESSES ARE THE RESULT OF HAZARDOUS CONDITIONS OR HAZARDOUS ACTS. HAZARDOUS ACTS refer to dangerous or other undesirable behavior and practices of people. HAZARDOUS CONDITIONS are mechanical, chemical, electrical, or other physical conditions within the workplace.

ANSWERS TO QUESTIONS:

1. a. *You* as supervisor

2. b. *You* as supervisor

3. b. Prevention and Control

Reaction means TREATING injuries and illnesses that result from accidents or toxic substances that have already happened. What is of interest here is DOING SOMETHING BEFORE accidents or exposures to hazards can occur to keep them from happening or to minimize the severity of the consequences.

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4. Indicate whether each example below is a hazardous act or a hazardous condition:

   a. If the employees in a repair shop fail to wear protective equipment to shield their eyes from irritating splashes and fumes when working at a liquid solvent cleaning tank, this is a HAZARDOUS _____.

   b. If there is no guard on the shear blade of a cutting machine, this is a HAZARDOUS _____.

   c. If the employees in a dusty, wood-sanding operation do not wear respirators because they dislike the extra breathing effort required, this is a HAZARDOUS _____.

   d. If employees in a foundry operation constantly get dust in their noses and mouths because dust collection and ventilation equipment is inadequate or improperly located, this is a HAZARDOUS _____.

5. Which of the items below are HAZARDOUS ACTS and which are HAZARDOUS CONDITIONS?

	Hazardous Act/Condition
a. The workspace is cluttered and there are many things to trip over	_____
b. Welders' helpers are not wearing equipment to protect their eyes from the harmful ultraviolet rays of the welding arc	_____
c. The lighting in the workplace is too dim to permit working safely and accurately	_____
d. An employee wearing a loose shirt with the shirttail out is feeding material between rollers	_____
e. Irritating paint spray mist from spraying operations is frequently in the air	_____
f. A carpenter who could not find a pry bar is using the blade of a pocket knife to pry open a tool box	_____

g. There is an accumulation of flammable oil and trash under the main motor in the pump room _____

h. An employee is standing on the top step of a step ladder to change light bulbs in ceiling fixtures _____

HAZARDOUS ACTS CAUSE INJURIES AND ILLNESSES

The immediate cause of an injury or illness is often (but not always) the most obvious cause, because it is likely to be one of the first things you notice when you try to find out how the incident occurred. An occupational injury or illness may have both a direct, IMMEDIATE cause and an underlying, BASIC cause. HAZARDOUS ACTS are one type of IMMEDIATE cause of injuries and illnesses.

Examples:

- In an accident involving an eye injury which occurred while an employee was working with a caustic solution, a hazardous act such as not wearing protective goggles could be the immediate cause of the injury.

- In the case of a job-related illness involving a respiratory infection, not wearing a respirator in a dusty work environment could be the immediate cause of the illness.

HAZARDOUS CONDITIONS CAUSE INJURIES AND ILLNESSES

HAZARDOUS CONDITIONS are also immediate causes of occupational injuries and illnesses.

Examples:

- A machine operator received a hand injury because the drill press he was operating did not have a hold-down clamp or drill block to keep the drill stock from spinning around when the drill seized in the hole being drilled. This is an example of a HAZARDOUS CONDITION being the immediate cause of an occupational injury.

  When investigating such an injury, one of the first things you are likely to discover is the fact that the drill press had no provision for securing the material being drilled.

- The cutting oil machinists use in a turning operation on a lathe frequently gets onto their hands and clothes. This oil made their skin and clothes oily and caused some operators to get a job-related illness involving chronic redness and ulceration of the skin. This is an example of a HAZARDOUS CONDITION being the immediate cause of an occupational illness.

  When investigating such an illness or condition, one of the first things you are likely to notice is that the skin and work clothes of the affected employees are frequently oily.

6. To summarize, fill in the blanks in the following sentence:

   Hazardous _____ _____ and hazardous _____ can be _____causes of both occupational injuries and occupational illnesses.

ANSWERS TO QUESTIONS:

4. a. Act b. Condition c. Act d. Condition

5. a. Hazardous Condition
   b. Hazardous Act
   c. Hazardous Condition
   d. Hazardous Act
   e. Hazardous Condition
   f. Hazardous Act
   g. Hazardous Condition
   h. Hazardous Act

   a., c., e., and g. are examples of *conditions in the workplace.*

   b., d., f., and h. are examples of *behavior of employees.*

6. Hazardous acts and hazardous conditions can be immediate causes of both occupational injuries and illnesses.

BASIC CAUSES

Basic causes of injuries and illnesses can be such things as inadequate personnel knowledge or skill, poor equipment or workspace design, or faulty maintenance. The underlying, basic causes of occupational injuries and illness are the reasons hazardous acts are performed and the reasons that hazardous conditions exist.

EXAMPLE: An employee receives an electric shock while using a portable power drill. Upon investigating the incident, you find that faulty insulation on the power cord and inadequate grounding of the drill are the direct, immediate causes of the injury. However, you also discover that the faulty insulation and inadequate grounding are the result of poor maintenance. Therefore, poor maintenance is the underlying basic cause of the injury.

ANOTHER EXAMPLE: A woman employee fails to wear a respirator while handling certain dusty chemicals because the respirator doesn't fit. As a result she gets an infection in her nose, throat and lungs. Not wearing the respirator is the direct, immediate cause of her illness. However, in investigating how the exposure occurred, it is discovered that she did not understand how to adjust the respirator. In this case, lack of knowledge is the underlying BASIC cause of the illness. The remedial action would be to train everyone to properly fit and use the respirator and to closely supervise the fit of respirators among all employees required to wear them.

Try this exercise:

7. A punch press lacks a guard to keep the operator's hands away from the punch press while it is in operation, and the operator is injured. The direct, immediate cause of the injury is found to be a lack of proper guarding on the machine. Further investigation shows the reason there is no guarding is that the machine is improperly designed. Therefore, improper design is the _____ cause of the injury.

8. An employee sustains a back injury while lifting an electric typewriter. Upon investigation you discover that she lifted the typewriter by bending from the waist and overreaching instead of bending her knees and using leg muscles to help lift. The direct, immediate cause of the injury was an unsafe act—improper lifting. The underlying, basic cause of the injury is:

   a. The weight of the typewriter

   b. A lack of knowledge or skill

ANSWERS TO QUESTIONS:

7. Basic

8. b. A lack of knowledge or skill.

   Remedial action to take in this case would be to train current employees in proper lifting and to include the subject of correct lifting in training for new employees (more about job safety and health training in Lesson 13).

PERSONAL FACTORS AND JOB-RELATED FACTORS

Personal Factors and Job-Related Factors are underlying BASIC causes of occupational injuries and illnesses. Lack of knowledge or skill, such as an employee who lifts a heavy, bulky object incorrectly, is an example of a PERSONAL FACTOR.

Improperly designed equipment, such as a power saw with no blade guards, is an example of a JOB-RELATED FACTOR.

Other examples:

- When a lift truck operator does not follow safety rules and drives a lift truck 20 MPH in a 5 MPH zone, this is a PERSONAL factor.
- When poorly maintained pipelines in a plant allow small, oozing leaks of toxic chemicals that can make employees sick, this is a JOB-RELATED factor.
- When personnel involved in handling materials take off protective gloves because of discomfort from the sweating the gloves cause, and as a result get a skin irritation from chemicals used, this is a PERSONAL factor.
- When there is a concentration of irritating paint mists in the air because of improperly designed spray booths and inadequate ventilation in a paint spraying operation, and as a result nearly all employees get throat irritations and bronchitis, this is a JOB-RELATED factor.

9. Behavioral patterns of employees that can result in injuries or illnesses are:

   a. Personal factors

   b. Job-related factors

10. Mechanical, electrical, chemical, and other physical conditions within the workplace that can cause injuries and illnesses are:

    a. Personal factors

    b. Job-related factors

When a personal factor causes an occupational injury or illness, this does not necessarily mean the employee involved is at fault. The reason for the hazardous behavior may be inadequate training, failure on the part of supervision to establish safe and healthful job procedures, or the existence of hazardous conditions that make unsafe behavior unavoidable.

ANSWERS TO QUESTIONS:

9. a. Personal factors

10. b. Job-related factors

EMPLOYER CONTROL

Generally, the employer has the authority to control the behavior of employees and to control the conditions of the workplace. The Act makes it the employer's responsibility to CONTROL both employee behavior and workplace conditions so they will be safe and healthful. This is an important point. Therefore, effective compliance with the Act is to a great extent dependent on voluntary exercise of employer control to eliminate hazardous acts and hazardous conditions in the workplace.

LACK OF EMPLOYER CONTROL

If the employer does not maintain proper control, hazardous acts and/or conditions can occur. As the representative of the employer, the supervisor directly exercises the employer's control over the occupational behavior of employees. When control is not properly exercised, occupational injuries and sickness can result.

EXAMPLE

An employee frequently operates a grinding machine with the shield pushed aside.

This hazardous act might be regularly performed because:

- The supervisor is unware of it;
- The supervisor knows about it, but does not consider it a problem; or because
- The supervisor does not feel it is his duty to order employees to protect themselves.

In any case, this demonstrates a lack of employer control. If the supervisor does not pay enough attention to how employees are performing their jobs to know when they are behaving hazardously, or does not recognize hazardous behavior when it occurs, or is not willing to live up to responsibility and demand that the employees use their equipment properly, the supervisor is not exercising proper employee control. Of course, employees also have the responsibility to perform in a safe and healthful manner—even when the supervisor is not around.

Consider a situation in which employees work with a lead compound. Lead dust gets on their hands. There are no food dispensing facilities, so all carry lunches, which they consume in a clean area adjacent to the locker room. Because their hands are virtually certain to be contaminated with the lead dust, they should wash thoroughly before handling and eating their food. Although there are signs pointing out the necessity for washing, there are no procedures for insuring it is done.

11. If the supervisor was not aware employees were not washing their hands each time before eating, if he was aware of it but did not consider it a problem, or if he did not think it was up to him to protect employees from their own hazardous actions, would lead poisoning be a case of a job-related illness resulting from lack of proper employer control?

    a. Yes

    b. No

ANSWERS TO QUESTIONS:

11. a. Yes.

Of course, employees share responsibility for protecting their own health. However, an employer or the supervisor, as the employer's representative, MUST NOT PERMIT employees to perform hazardous acts. In this situation, changing the conditions that caused employees' hands to become contaminated would eliminate the problem.

CONTROL OF CONDITIONS IN THE WORKPLACE

The employer has the responsibility and the authority to control the mechanical, electrical, chemical, and other physical conditions in the workplace. If the employer does not exercise proper control, hazardous conditions and injuries can result. For example, consider an injury caused by a rotten rope in a block and tackle being used to hoist engines in an automobile repair shop. In a situation like this, if the supervisor does not inspect or arrange for inspection of the equipment—as required by OSHA Standards—with sufficient care and frequency to detect a hazardous condition, or does not detect a hazardous condition, or does not acknowledge that he bears such responsibility and authority, that supervisor is not exercising proper control.

PREVENTION AND CONTROL PROGRAMS

There are four general approaches to an occupational injury and illness prevention and control program:

- Treatment after injuries and illnesses occur in order to minimize their severity;
- Identifying and eliminating IMMEDIATE causes of injuries and illnesses;
- Identifying and eliminating BASIC causes of injuries and illnesses;
- A combination of all.

Each approach has merit. Using any one of them will do some good; using two is better; but combining all three results in the most effective program.

REACTING (TREATING) OR PREVENTING

When an employer's safety and health program consists of treating injuries and illnesses in the dispensary, or sending employees home when something on the job makes them ill:

12. Is the employer REACTING to the results of accidents and exposures to harmful factors in the job environment?

    a. Yes

    b. No

13. Is the employer trying to PREVENT injuries and sicknesses from occurring?

    a. Yes

    b. No

ANSWERS TO QUESTIONS:

12. a. Yes

13. b. No

Immediate and effective medical attention for injured and ill employees is necessary, of course, but it has nothing to do with preventing a similar injury or illness from occurring again and again in the future.

A better approach than simply treating the results of accidents and exposures includes trying to DETECT AND ELIMINATE their IMMEDIATE causes. This involves investigating injuries and illnesses diagnosed as job-related in order to find the HAZARDOUS ACTS and HAZARDOUS CONDITIONS which caused them. Although this is a good approach, it is not the most effective.

For example, assume an accident or exposure to a health hazard occurs because a particular piece of equipment is poorly maintained which causes the equipment to malfunction. Repairing that piece of equipment will prevent another such incident with that particular machine for a while, but won't prevent other malfunctioning equipment of the same type from causing injuries or illnesses if poor maintenance is the BASIC CAUSE of all the equipment's being in poor repair.

THE BEST APPROACH

The most effective prevention and control program INCLUDES DETECTING AND ELIMINATING BOTH IMMEDIATE AND BASIC CAUSES OF INJURIES AND ILLNESSES. It means treating those injuries and illnesses that have occurred and investigating them to learn what caused them but these procedures are AFTER THE FACT. Detection and elimination of causes must also consider the factor of POTENTIAL--elimination of the causes BEFORE injury or illness happens.

To eliminate the POTENTIAL really means establishing and implementing a safety and health program. In keeping with the Act, it means, for example:

- Learning the occupational safety and health standards;
- Being able to identify those standards applicable to your operation;
- Measuring the extent to which your operation complies with the standards;
- Developing and implementing a plan—a priority system—to bring your operation into full compliance;
- Breaking down each task done by each employee to determine what hazards are involved, how serious they are, what standards they might involve, and how the hazards may be eliminated, corrected, or controlled. This procedure is called Job Hazard Analysis;
- Inspecting regularly, daily or oftener—as continuous as your rounds. From what you learned about standards, your priorities, your job hazard analyses—you should be able to make up a checklist to help avoid overlooking anything—act or condition—which might result in injury or illness. Adequate maintenance should be a part of your inspection; so should proper performance of all tasks by everyone, including yourself—and training everyone to perform properly.

Some of these factors will be discussed in more detail later in this lesson, as well as in others. They do not constitute a complete safety and health program, but they do provide the basics for VOLUNTARY COMPLIANCE with the Act. Further, they consist of aspects that lie largely within YOUR responsibility and authority as a supervisor. Don't underestimate what your efforts can accomplish in reducing hazards in your workplace. Also, don't forget that you and your employer are responsible for providing a safe and healthful workplace. Failure can result in penalties.

GETTING RESULTS

Three companies have initiated injury and illness prevention and control programs using different approaches.

- Company A attempts to minimize the effects of injuries and illnesses when they occur or are diagnosed.
- Company B takes the same action as Company A and also attempts to identify and eliminate the IMMEDIATE causes of injuries and illnesses.
- Company C takes the same action as Companies A and B, but in addition attempts to identify and eliminate the BASIC causes of injuries and illnesses.

Which of the above companies will get the best results? (Read and respond to the following by filling blanks with A, B, or C.)

14. Company_____ has a minimize-the-impact approach. Injury and sickness severity may be reduced, but injuries and illnesses are likely to continue to occur. Sooner or later something severe will probably happen and seriously injure or sicken some employee or maybe even kill someone.

15. Company_____ has a good idea. Injuries and sicknesses will probably be fewer, but it is likely that both injuries and illnesses will continue to occur all too often and with potentially disastrous consequences.

16. Company _____ will get the best results in the long run. Injury and illness will drop off in both frequence and severity because this company is eliminating the basic causes of accidents and exposures to health hazards.

ESTABLISHING A PROGRAM

FINDING OUT WHAT THE STANDARDS ARE

A basic step in setting up an injury and illness prevention and control program is to find out what the requirements are for a safe and healthful workplace. The OSHA Standards in the *Code of Federal Regulations* (29 CFR 1910), which you have learned about in previous lessons, contain this kind of information. OSHA Standards, rules, regulations, and announcements, such as proposed amendments, deletions, new standards, and scheduled hearings are published in the daily edition of the *FEDERAL REGISTER*. The ANNUAL edition of the 29 CFR 1910 contains the regulations and standards adopted during the year. There is also an OSHA subscription service available from the Government Printing Office which will report OSHA changes and updates, including the Field Operation Manual.

Finding the appropriate standard should not be too much of a problem. Suppose your employer is ready to initiate an injury and illness prevention and control program. As part of the program, you are preparing to conduct an inspection. One item to be inspected is a narrow stairway. In this case, you will find that OSHA Standard 1910.24 covers the subject of "fixed industrial stairs."

ANSWERS TO QUESTIONS:

14. Company A

15. Company B

16. Company C

TAKING MEASUREMENTS

After finding out what standards apply, the next step is to measure the items specified in the standards, in situations where these items can be measured. You were referred to OSHA Standard 1910.24 on fixed industrial stairs and found the following requirements:

- Minimum width of stairs must be 22 inches;
- Vertical clearance from stair tread to any overhead obstruction must be a minimum of 7 feet;

17. To decide whether the stairway in your workplace complies with these requirements, what measurements should you take? _____ and _____

COMPARING MEASUREMENTS TO STANDARDS

You measured the workplace stairway. It is 22 1/4 inches wide. The distance from stair tread to an overhead air conditioning duct is 7 1/4 feet. Compare these measurements to the requirements in the standard (refer to the preceding item).

18. Is the stairway in compliance with the standard?

    a. Yes

    b. No

In determining inspection requirements, let's suppose you want to find out how often to inspect the fire protection equipment in your workplace. Some of the OSHA standards on the subject of fire protection are in the following:

OSHA Standard 1910.157 Portable fire extinguishers;
OSHA Standard 1910.158 Standpipe and hose systems;
OSHA Standard 1910.159 Automatic sprinkler systems;
OSHA Standard 1910.160 Fixed dry chemical extinguishing systems;
OSHA Standard 1910.161 Carbon dioxide extinguishing systems.

In addition to minimum inspection requirements, these standards contain other specific requirements, such as maintenance requirements.

ANSWERS TO QUESTIONS:

17. Stair width and distance from stair tread to overhead obstruction

    (Actually, this standard also includes other specific requirements including stair strength, length, angle of rise, railings and handrails, etc., but for purposes of simplicity in this example, only two specific requirements are given.)

18. Yes.

    If the stairway had been 20 inches wide or if the overhead obstruction had been only 6 1/2 feet from the stair tread, the stairway would not have complied with the standard. Most standards specify the minimum requirements that have to be met.

INSPECTION FREQUENCY

Standard 1910.157, which covers portable fire extinguishers, contains the following information:

- Extinguishers shall be inspected monthly, or at more frequent intervals when circumstances require;
- Extinguishers shall receive periodic maintenance and recharging, as required, at regular intervals, not more than one year apart (this standard also includes other specific requirements for portable fire extinguishers).

19. According to the standard, what is the maximum allowable time between inspections?

20. What is the maximum allowable time between maintenance operations?

EVALUATING HOW WELL STANDARDS ARE MET

The process of judging how well an item in your workplace meets the OSHA standards is called EVALUATION. When you compared the measurements of the stairway in your workplace with the requirements in the standard and decided whether or not the stairway does or does not meet the requirements, this is an example of making an EVALUATION of how well the stairway met the standard. This process of evaluating how close an object condition, or action comes to the desired condition is not done only with OSHA standards. It is a process everyone frequently goes through in everyday life to see if actions or material objects or conditions are meeting expectations.

DETERMINING COMPLIANCE WITH THE STANDARDS

There are logical steps to follow in determining whether your workplace complies with the OSHA standards that apply to it. First, find out what the standards are, then measure items in your workplace, and finally you compare the measurements with the standards and evaluate how well the standards are being met. You should try to develop a questioning state of mind so you are constantly on the lookout for situations that do not conform to good safety and health practice or meet the standards. In this way you will detect many problems before they produce injuries or illnesses.

ANSWERS TO QUESTIONS:

19. One month

20. One Year

Again, these are the maximum allowable times. It is very desirable to perform inspections and maintenance as frequently as practical.

GET HELP WHEN NECESSARY

Evaluating compliance with some standards can be complicated and require the assistance of experts. More information about where to get this kind of technical assistance, inside or outside your company, appears in Lesson 14.

STEPS IN DETERMINING COMPLIANCE (An Exercise)

21. Use the words below to fill in the blanks.

- Standards
- Compare
- Measure
- Evaluate

a. Find out what the federal _____ are that apply to your workplace.

b. _____ the items in your workplace for which there are standards.

c. _____ the measurements to the standards and _____ how well your workplace meets the standards.

THE SPIRIT OF THE LAW

Section 5a of the Act, better known as the GENERAL DUTY CLAUSE, requires an employer to provide a safe and healthful workplace regardless of whether or not there is an applicable standard. The purpose of this part of the law is to assure that the spirit of the law is complied with in situations not covered by the letter of the law. This is another example of the positive, humanitarian purpose which the spirit of the law reflects.

ESTABLISH OBJECTIVES

To eliminate deviations from standards, establish OBJECTIVES for your injury and illness prevention and control program in terms of specific actions, or end results, necessary to meet specific standards. The objectives of your program should be to eliminate deviations from the standards.

It makes sense to state objectives in terms of things to be done, or results that you want, because it is easier to get action when it is clear what action is wanted.

WHAT RESULTS DO YOU WANT?

The objectives of your injury and illness prevention and control program should be specific, realistic, and stated in terms of the results that you want. Supervisor A has an operation of a type that requires

ANSWERS TO QUESTIONS:

21. a. standards b. measure c. compare, evaluate

---

protective equipment to be worn by personnel to keep them from being made ill by toxic fumes. Supervisor B has an operation with a higher than average risk of fire.

22. Which program objective below would be a good one for Supervisor A and which would be a good one for Supervisor B?

    a. OBJECTIVE: Every employee in the operation will use or wear protective equipment as a natural part of the job. _____

    b. OBJECTIVE: Every unit leader will be trained to check the fire protection equipment in the workplace at the turn of each shift. _____

GET IDEAS FOR OBJECTIVES FROM THE STANDARDS

OSHA standards that apply to your workplace will suggest objectives for your injury and sickness prevention and control program. In Lesson 14 you will find an index of the OSHA standards to assist you in finding the standards that relate to your jobsite. Section 1910.157, for example, requires MONTHLY inspections of portable fire extinguishers and YEARLY periodic maintenance.

Below are some objectives suggested by CFR 1910.157 that would be appropriate if you have the portable fire extinguishers in your workplace.

- OBJECTIVE: Portable fire extinguishers will be inspected and tested at least once a month to make certain they will work when needed.

- OBJECTIVE: Portable fire extinguishers will receive periodic maintenance at least once a year.

JOB HAZARD ANALYSIS

WHAT YOU CAN DO

You can help to make your workplace safe and healthful by identifying and correcting hazardous job procedures and job conditions that can cause injury or illness. JOB HAZARD ANALYSIS and FACILITY INSPECTION are two techniques for doing this. The following items will tell you more about job hazard analysis. Lesson 7 will discuss facility inspection.

A DESCRIPTION OF THE JOB

JOB HAZARD ANALYSIS is a technique for describing a job by breaking it down into a basic sequence of steps. A JOB HAZARD ANALYSIS helps to determine what has to be done to make a job safe and healthful. A job analysis is useful in identifying job hazards, in developing safe and healthful job procedures, and in describing necessary personal protective equipment. A job analysis also would be useful in planning job safety and health training for employees. Lesson 13 will tell you more about the use of job analysis in such training.

ANSWERS TO QUESTIONS:

22. a. Objective - Supervisor A
    b. Objective - Supervisor B

SAFETY AND HEALTH ARE A PART OF THE JOB

Many progressive establishments have adopted the idea that safety and health are as much an integral part of an employee's total job as work efficiency, quality, and productivity. These establishments use the job hazard analysis as an aid in creating safer, healthier, and more efficient jobs.

ANALYZING A JOB

There are three parts to a job hazard analysis:

- OBSERVING one or more employees performing the job in order to break the job down into steps. The breakdown should be listed in the logical performance order of major tasks and subtasks.
- IDENTIFYING hazardous job procedures and conditions and describing procedures and precautions that are key factors in safe and healthful job performance.
- DEVELOPING ways to take the hazards out of the job.

WORST FIRST

A good rule of thumb for selecting jobs to be analyzed is to conduct analyses on a "worst-first" basis. "Worst-first" means that jobs that have the most severe or most frequent injuries or illnesses, or involve the largest number of employees, are analyzed first. This makes it possible for employers to concentrate their first efforts on the most serious hazards affecting the most employees.

BRIEFING EMPLOYEES

When the job to be analyzed has been determined, select one or more employees to be observed performing the job. Brief the employees you are going to observe. Explain the technique of job hazard analysis. Tell them that the purpose of the job observation and analysis is to make the job safe and healthful for them and their fellow employees by identifying hazards and developing ways to eliminate and control these hazards. Reassure employees that it is the job that is being studied, not them as individuals.

23. What you want to accomplish by briefing the employees is to get them to be _____ without being _____.

    (Choose two words from the following list to fill the blanks.)

    - Apprehensive
    - Careless
    - Indifferent
    - Cooperative

ANSWERS TO QUESTIONS:

23. cooperative apprehensive

It is natural for employees to feel that when someone (especially their supervisor) is carefully watching every move they make, the purpose might be to find out if they are goofing off or doing something wrong. That is why it is IMPORTANT to convince employees that the purpose of job observation and analysis is to make their jobs safe and healthful.

JOB OBSERVATION

Begin the job observation by noting each action the employee performs in relation to the material, the machine, the tools, and the work environment. List each basic step necessary to do the job. Be sure the steps are not too detailed or too general. For example, a sequence of steps with the right level of detail, describing the job of repainting a chair, would read something like this:

Step 1: select work area

Step 2: bring painting tools and supplies to work area

Step 3: prepare work area

Step 4: remove old paint

Step 5: sand chair

Step 6: apply first coat of paint

(and so on . . .)

Only part of the sequence of steps appears here. The complete sequence would describe the entire job, including application of the final coat of paint, cleaning the work area, and putting the tools away.

24. Below are parts of two examples of job analyses that might be made of this job. One sequence is too general and one is too detailed. Which is which?

Sequence a.

Step 1: remove old paint
Step 2: paint chair

Sequence b.

Step 1: remove lid from paint can
Step 2: dip brush into paint can
Step 3: drain excess paint off brush by wiping one side of brush on inside of can top
Step 4: place brush against chair (and so on. . .)

a. Too _____ b. Too _____

ANSWERS TO QUESTIONS

24. a. too general b. too detailed

SEARCH FOR HAZARDS

In your job observation, look for hazards involving job procedures as well as the job environment. At each point, consider whether or not an accident or exposure to a harmful factor could occur and, if so, how. Ask yourself questions such as:

- Does the employee handle or work near substances that are toxic, caustic, or hot?
- Is the air dusty?
- Are there fumes, vapors, or mists in the air?
- Is the work environment very noisy?
- Is the work environment very hot or cold?
- Is there a lot of vibration?
- Is the lighting adequate?
- Could the employee strike against, be struck by, or otherwise make harmful contact with an object?
- Could the employee be caught on, in, or between objects?
- Could the employee fall on the same level or to another level?
- Does the employee have to push, pull, or lift objects?

Considering all relevant questions like these is part of the process of identifying potential hazards to the safety and health of the employees performing the job.

SOLVE PROBLEMS LATER

At the time you are observing the employee performing the job, recording the job steps, and looking for hazards, do not try to solve any problems you detect. At this point you are concentrating on recording what is being done, how it is being done, and what could be dangerous about it.

25. The process of deciding how to take the hazards out of the job comes _____.

a. Now

b. Later

ANSWERS TO QUESTIONS:

25. b. Later

An exception would be a situation where you happen to see an employee doing something that clearly and immediately endangers the employee's safety or health, or the safety or health of some other employee. In that case, stop the operation immediately and make corrections.

WHAT ARE THE KEY FACTORS?

Once you have listed the basic steps and described the hazards associated with each step, you are ready to identify the KEY FACTORS that are essential for safe and healthful job performance. KEY FACTORS ARE THE PROCEDURES THAT MUST BE FOLLOWED AND THE PRECAUTIONS THAT MUST BE TAKEN IN ORDER TO AVOID AN ACCIDENT OR EXPOSURE TO A HARMFUL FACTOR IN THE WORK ENVIRONMENT.

EXAMPLES:

- For an employee who services automotive equipment, a key factor might be: CHECK THAT THE GUARD RAIL around the grease pit is in place.
- For a machinist, a key factor might be: ALWAYS REPLACE THE SAFETY GUARD over the drive belt before starting the machine.
- For an oil refinery employee where poisonous hydrogen sulfide gas is a by-product, a key factor might be: If the warning signal sounds and it is necessary to put on a gas mask and escape, remember that the mask works on a self-demand basis which means the air won't begin to flow until you start to breathe. Don't panic. Don't open the sides of the mask because this will let you inhale the gas.
- In a job involving unloading trucks, a key factor might be: Secure the dock-plate between the dock and the truck platform before walking or driving a forklift truck over the dock-plate.

TAKE THE HAZARD OUT OF THE JOB

After you have identified the hazards in a job, you should try to develop solutions to eliminate or minimize the hazards in accord with the standards. Some of the ways to eliminate or minimize job hazards are:

- MODIFY the equipment;
- CHANGE some of the procedures;
- PROVIDE auxiliary equipment or tools;
- PROVIDE personal protective equipment;
- REPLACE the equipment and/or change the process;
- REDUCE the number of times a hazardous operation is performed.

PERSONAL PROTECTIVE EQUIPMENT, AUXILIARY TOOLS, AND PROCEDURES

Sometimes a hazard can be removed from a job or its effects can be minimized by PROVIDING AUXILIARY TOOLS and PERSONAL PROTECTIVE EQUIPMENT, and CHANGING SOME OF THE PROCEDURES. As an example, consider the following step in the job of a machinist. This step involves the grinding of parts against a revolving abrasive wheel without using any auxiliary tools or personal protective equipment.

Step 10: By hand, hold the part to be ground against the revolving abrasive wheel.

Two HAZARDS connected with this step have been identified:

Hazard 1. The operator's fingers or hand may come in contact with the revolving abrasive wheel.

Hazard 2. The operator may be struck by flying particles if the revolving abrasive wheel explodes.

To protect the employee against these HAZARDS, the following CHANGES can be made (find the standards applicable and check them):

Change 1. PROVIDE tongs and CHANGE the procedure so they are used to hold the parts being ground against the wheel. This change protects against Hazard 1.

Change 2. PROVIDE safety goggles and CHANGE the procedure to require that goggles be worn during grinding wheel operations. This change protects against Hazard 2.

MODIFYING THE EQUIPMENT

Sometimes the effects of a job HAZARD can be eliminated or minimized by MODIFYING THE EQUIPMENT and CHANGING SOME OF THE PROCEDURES. In the case of the machinist's job mentioned previously, the following changes could be made:

Change 1. MODIFY the equipment by installing a work rest; CHANGE the procedure to require the work rest to be securely clamped within 1/8 inch of the abrasive wheel and used to rest the part on while it is being held against the abrasive wheel for grinding.

Change 2. MODIFY the machine by installing a safety glass shield and CHANGE the procedure to require the shield to be in place during grinding operations.

26. Which CHANGE would be to protect the machinist's fingers and hands from striking against the revolving abrasive wheel?

27. Which CHANGE would be to protect the operator from being struck by flying particles?

REPLACE THE EQUIPMENT AND/OR CHANGE THE PROCESS

Other methods of eliminating a hazard involve REPLACING THE EQUIPMENT and/or COMPLETELY CHANGING THE WAY OF DOING THE JOB.

28. Would automating and isolating a hazardous process so that the operator can control the process from a remote location be an example of this kind of change?

a. Yes

b. No

ANSWERS TO QUESTIONS:

26. Change 1.

MODIFYING the equipment by installing the work rests on the machine and CHANGING the procedure to ensure proper use of the work rest would protect the operator's fingers and hands.

27. Change 2.

MODIFYING the equipment by installing the safety glass shield (in addition to having the operator wear protective goggles) and CHANGING the procedure would protect the operator's face and body, as well as the operator's eyes, from flying particles.

28. a. Yes

REDUCING THE RECURRENCY RATE

Reducing the number of times a hazardous operation has to be performed is called reducing the RECURRENCY rate. This kind of change should be used only as a last resort, since it does NOTHING to eliminate the hazard, but only REDUCES THE FREQUENCY with which the employee is exposed to it.

A PART OF JOB HAZARD ANALYSIS

Supervisor A has observed several employees performing a job in a chrome plating plant. One action each employee performs is described below:

Step 19: Add the powdered chemical concentrate to the vat of hot liquid chemical solution.

29. This is a description of:

a. One step in a sequence of steps which the employee performs in doing the job;

b. A hazard connected with the job;

c. A procedure or precaution that is a key factor in performing the step safely and healthfully.

As a part of the job analysis, Supervisor A has recorded the following information:

When the powdered chemical concentrate is added to the hot chemical solution in the vat, there is a danger the solution will react chemically and splatter the employee with the hot, caustic solution.

30. This is a description of:

a. One step in a sequence of steps which the employee performs in doing the job;

b. A hazard connected with the job;

c. A procedure or precaution that is a key factor in performing the step safely and healthfully.

ANSWERS TO QUESTIONS:

29. a.

30. b.

Other information Supervisor A has recorded as part of the job analysis is:

- The employee must be sure the temperature of the liquid chemical solution in the vat is not too hot when the powdered chemical concentrate is added to avoid boiling and splattering. If the solution is too hot, the temperature must be lowered before adding the powdered chemical.
- The employee must wear chemical safety goggles while adding the powdered chemical.

31. This information is a description of:

    a. Steps in the sequence of tasks the employee performs in doing a job;

    b. Hazards connected with the job;

    c. Procedures and precautions that are key factors in performing a job step safely and healthfully.

ELIMINATE HAZARDS

As described previously, Supervisor A did the following things:

- Selected the job to be analyzed.
- Observed several employees performing the job and broke the job down into a sequence of steps.
- Identified hazards involved in doing the job.
- Described procedures and precautions that are key factors in doing the job safely and healthfully.

The next thing Supervisor A should do is to determine ways to take the hazard out of the job.

WHICH KIND OF CHANGE?

In the job Supervisor A observed, keeping the temperature of the hot chemical solution in the vat below a certain critical level is important in preventing the solution from boiling and splattering when the powdered chemical is added. The present procedure by which the employee who is going to add the powdered chemical determines the temperature of the solution is by looking at it and making a judgment as to how hot it is on the basis of how much it is bubbling and steaming.

ANSWERS TO QUESTIONS:

31. c.

---

32. If a special kind of portable thermometer is PROVIDED and the procedure is CHANGED so that the employee uses the thermometer to measure the temperature of the hot chemical solution in the vat, which two kinds of changes would these be?

    a. MODIFYING the equipment

    b. CHANGING some of the procedures

    c. PROVIDING auxiliary equipment or tools

    d. PROVIDING personal protective equipment

    e. REPLACING the equipment and/or changing the process

    f. REDUCING the number of times a hazardous operation is performed

Using the same chrome plating plant and its chemical vat as an example, let's say that a current procedure for adding powdered chemical to the hot liquid solution calls for the employee to wear protective goggles. IF protective gloves and protective clothing are PROVIDED and the procedure is changed to require wearing of the gloves and clothing as well as the goggles, then two kinds of changes have taken place:

- providing personal protective equipment
- changing some of the procedures

In this case, the protective gloves and clothing would protect the employee's hands and body, in addition to the protection of the employee's eyes by the chemical goggles, but the likelihood of being splattered by the hot, caustic solution still would exist.

33. If the following changes are made in this same plant, what two kinds of changes would they be?

    - INSTALL a thermometer on the vat and CHANGE the procedure so that the thermometer is used to monitor the temperature of the hot liquid chemical solution.
    - INSTALL an automated dispenser unit on the vat and CHANGE the procedure so that the dispenser is first filled with the chemical powder and then activated from a location remote from the vat.

    Fill in the blanks by selecting from the list below:

    The two kinds of changes would be _____ and _____

---

    a. MODIFYING the equipment

    b. CHANGING some of the procedures

ANSWERS TO QUESTIONS:

32. b. c.

While this would be a better way to determine the temperature of the solution, it might present a hazard to the employee in the process of inserting the portable thermometer into the solution.

---

c. PROVIDING auxiliary equipment or tools

d. PROVIDING personal protective equipment

e. REPLACING the equipment and/or changing the process

f. REDUCING the number of times a hazardous operation is performed

HAZARDS AND KEY FACTORS

Below is a description of the steps a chemistry laboratory assistant performs when washing the laboratory utensils used in routine tests on an industrial process.

Step 1: empty chemical residue from utensils and stack them beside the sink

Step 2: fill the sink with hot water and add washing powder

Step 3: wash and rinse laboratory utensils and place in drain rack

Step 4: remove air-dried utensils from rack and put away

Step 5: clean sink and put away washing supplies

Column A lists some of the hazards involved in the job. Column B lists some procedures and precautions which are key factors in performing the job in a safe and healthful manner. MATCH each hazard with the key factor that would help to protect the employee from the hazard.

Column A

34. Improper disposal of chemical residue may cause employee to make harmful contact with chemicals.

35. Utensils that are insecurely stacked may fall, break, and cut the employee.

36. If water temperature is too hot, employees' hands may be burned.

37. Employees may inhale washing powder and develop a respiration irritation.

38. Washing powder may defat employees' skin and cause skin disorder.

Column B

a. Wear rubber gloves while washing utensils.

b. Add washing powder gently from a minimum height and with a minimum of agitation of the container.

c. Measure the temperature of the water with a thermometer before immersing hands.

d. Clear a large enough space on the counter to securely stack the utensils.

e. Empty chemical residue into specific waste receptacles of approved design specified by the chemists using the chemicals.

ANSWERS TO QUESTIONS:

33. a. b.

34. e. 35. d. 36. c. 37. b. 38. a.

(For the purpose of simplicity in these examples, only one employee's actions have been described. However, when performing a job analysis, it is always desirable to observe more than one employee at the job.)

ELIMINATE HAZARDS

Some ways of eliminating or minimizing job hazards are described in Column A. The names of kinds of changes are listed in Column B. MATCH each DESCRIPTION of a change with the NAME of the kind of change.

Column A

39. To avoid damage to employees' hearing, MODIFY the equipment to make it quieter and to reduce the noise level.

40. To avoid laboratory assistants' getting burned by hot water or developing irritations from washing powder while washing laboratory utensils, INSTALL an electric dishwasher.

41. To avoid employee's getting cut in an operation involving use of knives, CHANGE the procedure for using knife holders.

42. To minimize the chances of employees' getting hurt by using a metal press, REDUCE the number of times the pressing operation has to be performed.

Column B

a. A CHANGE in some of the procedures

b. A MODIFICATION of the equipment

c. A REPLACEMENT of the equipment and a complete change in the way of doing the job

d. A REDUCTION in the number of times a hazardous operation has to be done

THE BENEFITS

By applying the principles of injury and illness prevention and control to help you do the safety and health part of your job effectively, and by using the technique of job analysis to assist you in taking the hazards out of the jobs in your workplace, you will be making your entire task easier in the long run. Conscientious efforts to comply with the requirements of the Act will benefit you, your employer, and the employees you supervise.

ANSWERS TO QUESTIONS:

39. b. 40. c. 41. a. 42. d.

SUMMARY

In this lesson, you have learned about the fundamentals of occupational injury and illness prevention and control. The value of taking action to prevent the occurrence of accidents and exposures to health hazards or to control the severity of the consequences was discussed. The importance of knowing the causes of these events in order to take preventive action was emphasized. TECHNIQUES for IDENTIFYING and CORRECTING THE HAZARDOUS ACTS and HAZARDOUS CONDITIONS that are the immediate causes of accidents were covered. The necessity of discovering the PERSONAL factors and JOB-RELATED factors that are the basic causes of occupational injuries and illnesses and methods of eliminating the basic causes were described. The IMPORTANCE of exercising proper employer control to effectively prevent injuries and illnesses was discussed. The process of finding out what the standards are that apply to your workplace, taking measurements of items in the workplace, comparing the measurements to the standards, evaluating how well the standards are met, and setting objectives for meeting the standards as integral components of an injury and illness prevention and control program was outlined. The usefulness of the technique of job analysis as one method of taking the hazards out of the job was described in detail. This lesson has made clear the vital role you as the supervisor play in the elimination of injuries and illnesses from your workplace.

LESSON 5

INVESTIGATING AND REPORTING ACCIDENTS AND EXPOSURES TO HEALTH HAZARDS IN THE WORKPLACE

The purpose of this lesson is to teach you how to encourage employees to report accidents, exposures to health hazards, and near-misses, and how to conduct an investigation of these events.

Careful study of this lesson will enable you to use the techniques necessary for interviewing employees involved in accidents and exposures to health hazards, and for interviewing witnesses and conducting reenactments of such events.

In this lesson you will learn what the report of investigation must contain, and how to make recommendations for corrective action. In addition, you will be made aware of the usefulness of the concepts of loss severity potential and probable recurrence rate in setting priorities for corrective action.

HOW TO CONDUCT AN INVESTIGATION

In this lesson you will learn how to conduct an investigation of an occupational accident or an exposure to a health hazard in the workplace. The purpose of such an investigation is to collect information for the following uses:

- To determine the causes of the accident or exposure to a health hazard and the actions that need to be taken to prevent or control a recurrence.
- To determine whether a violation of the federal safety and health standards was involved in the incident and, if so, what steps are required to eliminate the violation.
- To prepare the records and reports required by the Occupational Safety and Health Act regarding occupational injuries and illnesses.
- To prepare the safety and health records and reports required by your employer.

PART OF A TOTAL PROGRAM

The process of investigating accidents and exposures to health hazards is part of a total occupational injury and illness prevention and control program. In order to most effectively accomplish the objectives of such a program, it is desirable to investigate all of the following kinds of events:

- Incidents that result in injury or death.
- One-time exposures to health hazards that immediately result in illness or death.
- Repeated exposures to health hazards that eventually result in illness or death.
- Events that could have resulted in injury, illness, or death, but which, by chance, did not.

Each of these kinds of events will be discussed in the following items.

PROPERTY DAMAGE

As you learned in Lesson 3, the Act requires that occupational injuries, illnesses, and deaths be reported but does NOT require the reporting of events that result in property damage only. However, in this lesson, property damage is included in the definition of an event to be investigated because, from a prevention and control viewpoint, any incident that is severe enough to damage property may have the potential of causing injury, illness, or death of an employee.

An occupational accident usually is defined as an unexpected event occurring on the job that results in injury, health impairment, death, or property damage.

1. According to this definition, would all of the events described below be called accidents?

	Yes	*No*
a. an incident causing a burn on an employee's arm	___	___
b. an incident causing the fork lift on a lift truck to break	___	___
c. an incident causing a shipping container to split open and an employee to be bruised	___	___

In some jobs, an employee can develop a chronic, acute, or fatal illness or disease, or a disabling condition as a result of exposure to health hazards in the work environment. An illness, disease, or disabling condition is considered to be OCCUPATIONAL when it is caused by exposure to a health hazard on the job.

WHAT IS A HEALTH HAZARD?

Health hazards can be INVISIBLE PHYSICAL AGENTS such as excessive noise or vibration or extreme heat or cold, or VISIBLE MATERIALS such as toxic or abrasive dusts, chemicals, solvents, fumes, mists, or gases. ("Visible" MATERIALS may not be visible to the eye, but require a detection or measuring device.) EXPOSURE can occur in several ways, including direct contact, inhalation into the lungs, absorption through the skin, or ingestion with food and drink. Harmful exposures can be either one-time exposures resulting in acute symptoms or repeated exposures whose effects become evident over a period of time.

EXAMPLE OF HEALTH HAZARD DUE TO MATERIAL

Employees in a chrome plating plant are repeatedly exposed to acid mist from the chromic acid used in the plating process, and can develop ulcers on their skin or in their noses as a result. This is an example of a job-related illness caused by exposure to a hazardous MATERIAL in the work environment over a period of time.

EXAMPLE OF A HAZARDOUS PHYSICAL AGENT

An employee in a plant that manufactures boilers is repeatedly exposed to a HIGH NOISE LEVEL and develops a hearing loss as a result. This is an example of a job-related disabling condition resulting from exposure to a hazardous PHYSICAL FACTOR in the work environment over a period of time.

ANSWERS TO QUESTIONS:

1. a., b., c., All "Yes."

WHAT IS A NEAR-MISS?

There is another kind of event that could have caused injury, illness, death, or property damage and only by chance did not. This is called a NEAR-MISS.

2. Which incident below is a near-miss?

   a. an exposure to a health hazard causing an employee to contract a respiratory infection

   b. an incident causing a high pressure tank to explode

   c. an accident causing a scaffolding to give way and an employee to fall and break a leg

   d. an incident in which a stack of boxes falls over but causes no injury or damage to property

To reiterate then, an event that could have resulted in injury, illness, death or property damage and only by chance did not is called a near-miss.

HOW TO GET EVENTS REPORTED

YOU HAVE TO KNOW ABOUT IT

In order for you to FIND OUT about an accident, an exposure to a health hazard, or a near-miss you have not observed personally so that you can INVESTIGATE, it must be REPORTED to you.

3. Which of the following situations is more likely to continue WITHOUT investigation because you do NOT know about it?

   a. In one area of your plant, employees find that sometimes their vision blurs or their legs go limp when they work around certain chemicals. THEY DO NOT REPORT IT TO YOU, and you never see it happen.

   b. The welders you supervise REPORT TO YOU that when they started to weld in an asphalt tank which had been poorly cleaned, the remaining asphalt caught fire. They tell you they were able to extinguish the fire, but they could not finish the welding job without the same thing happening again.

ANSWERS TO QUESTIONS:

2. d.

3. a. Obviously, you cannot see everything that happens in your work area. You cannot make a report about, or do anything to fix something if it isn't reported to you. One of your jobs, therefore, is to get your employees to report incidents to you.

IF IT IS SERIOUS IT IS MORE LIKELY TO BE REPORTED

Accidents with serious consequences and exposures to health hazards that produce immediate severe symptoms are more likely to be reported than accidents with minor consequences or exposures with minor or delayed symptoms.

4. Which four incidents below are most likely to be reported?

   a. Brakeman falls, resulting in a broken arm.

   b. Secretary suffers a minor cut on finger from letter opener.

   c. Keypunch operator receives mild electric shock.

   d. Installer notes a single frayed wire on a cable.

   e. Mason is knocked out by blow on head from falling concrete block.

   f. Girl in blueprint room develops mild skin rash.

   g. Woman in photo lab has occasional nausea, dizziness, or headache.

   h. Welder is overcome by carbon monoxide gas from nearby motor generator tor his arc welder.

   i. Lumberjacks who use chainsaws find slight, gradual loss of hearing.

   j. Stevedores handling alkali and dyestuff have severe respiratory infection.

5. The types of occupational accidents and exposures to health hazards most likely not to be reported are those with _____ consequences or symptoms.

   a. Major

   b. Minor

When a near-miss or an occupational accident or exposure to a health hazard that has minor consequences or symptoms is not reported, one reason may be because the incident SEEMS unimportant to the employees who were involved or who observed the incident. The problem with this attitude is that employees fail to realize that whatever caused the unreported incident could produce an accident or exposure with much more serious consequences at some other time. It is up to you as the supervisor to educate employees to report near-misses as well as actual injuries and sicknesses.

ANSWERS TO QUESTIONS:

4. a., e., h., j. are most likely to be reported.

5. b. Minor. But does that mean that the minor consequences are necessarily unimportant? No! Look back at Question 4; "c." may be the first indication of what is becoming a serious electrical fault. "i." is the subtle first warning of future major deafness if the lumberjacks continue to work in that job with that equipment. The lesson to be learned is to get your employees to report everything!

LACK OF KNOWLEDGE

In the case of a job-related illness with minor, infrequent, delayed, or cumulative symptoms, another reason exposures to health hazards are not reported may be that employees do not realize the symptoms are related to hazards in the workplace. Employees also may fail to realize that repeated exposures to such hazards can result in eventual health impairment.

6. Is it part of your job as supervisor to teach employees to report these symptoms?

   a. Yes

   b. No

A NEAR-MISS

Consider an incident where an employee flipped up the guard on a gearbox to oil the gears while the machine was still running. This way he kept production going. He caught his glove in the gears, but the glove was pulled off his hand when he jerked away so that his fingers were not caught in the gears.

7. Is this the type of event that is not likely to be reported even though it could have had serious consequences?

   a. Yes

   b. No

REASONS EVENTS ARE NOT REPORTED

In addition to not reporting accidents, exposures to health hazards or near-misses because they SEEM unimportant, employees tend not to report such events for several other reasons:

- Not wanting to spoil the safety and health record of the department.
- Distaste for kidding by fellow employees about being chicken.
- Fear of having to undergo medical treatment.
- Not wanting to displease supervisor.
- Not wanting to lose time from the job while the condition is improved.
- Unawareness that the illness is related to workplace hazards.
- Failure to detect symptoms of hazardous exposures until they become serious.

ANSWERS TO QUESTIONS:

6. a. Yes, definitely! For example, employees often tempt fate by assuming that if they do some kind of operation fast enough they won't experience any bad effects because they see no immediate effects. In reality, they may be gradually accumulating a severe dose from these repeated, brief exposures.

7. a. Yes. In this case, the employee performed a hazardous act because he thought that the production schedule did not allow time to shut down the machine for oiling. If this event had been reported, consideration might have been given to revising the production schedule to allow for safe performance of necessary maintenance; or to give the employee some instruction in the necessity to sacrifice some production in the interest of safety.

Each of these reasons has a logical counterargument or counterattack which you can, and must, be able to give to employees. In the following items some of these approaches are discussed.

Employees you supervise may be reluctant to report a near-miss, an accident, or exposure to a health hazard which has minor consequences or symptoms because it will spoil the safety and health record of the organization.

8. If so, which is the better thing to say to them to encourage reporting of such incidents?

   a. Point out that if a hazard doesn't get eliminated it can cause an accident or exposure with serious consequences and that a serious injury or illness is a much worse mark on the safety and health record than a minor one or a near-miss.

   b. Tell employees you want a perfect safety and health record and you don't want to know what they have to do to keep it that way.

9. If the employees hesitate to report near-misses or accidents or exposures to health hazards with minor consequences or symptoms because they are afraid you will be displeased, which is the better thing to say to them to encourage reporting of such incidents?

   a. Ask employees where they got the idea you would be displeased. (Be very emphatic. Use a loud, belligerent voice. Pound your fist on the table.)

   b. Tell employees that what really displeases you is when you find out that an accident, exposure to a health hazard, or near-miss WAS NOT REPORTED.

HOW MUCH TIME IS REALLY LOST?

10. If your employees avoid reporting near-misses or accidents or exposures to health hazards with minor consequences or symptoms, because it causes lost time from the job, which is the better thing to say to them to encourage reporting of such incidents?

    a. Tell employees that the time spent reporting such an event is like insurance, because if the hazard isn't eliminated it could cause another such event and someone could be seriously hurt or his or her health impaired—maybe the one who did not report the first incident.

    b. Tell employees they can wait until after work and do the reporting on their own time.

ANSWERS TO QUESTIONS:

8. a

9. b

10. a

MEDICAL TREATMENT

If employees are reluctant to file the report because they are apprehensive about medical treatment, tell them that immediate medical treatment is likely to be less extensive and painful than delayed treatment for a neglected condition. Besides, if they put it off, the condition might get worse. It is more important to know what is happening so the hazard can be removed.

ENCOURAGE RESPONSIBILITY

If your employees don't make the reports because they want to avoid being kidded by fellow employees, tell employees that taking a little kidding isn't nearly as bad as being responsible and feeling guilty if a hazard they know about isn't eliminated and someone gets hurt seriously or gets very sick. After all, the people doing the kidding are the ones who are being foolish and irresponsible. They are minimizing the benefits of being safe and healthy and suggesting it is better to take chances with their lives. It is obvious that those who kid around about safety and health are simply being stupid. Ask employees if they would rather be well and safe? Ask them who is really the smarter one - the reporter or the kidder?

11. In cases where employees do not make reports because they do not realize the symptoms are related to hazards in the workplace, which is the better thing to do to encourage reporting?

    a. Conduct a training program to teach employees about the health hazards of their jobs and what the symptoms of harmful exposure are likely to be.

    b. Adopt the attitude that it is the responsibility of employees to find out this kind of information for themselves.

DETECTING SYMPTOMS

Regular appropriate health tests, such as urine, blood, patch, hearing, or fat biopsies, as may be appropriate, to employees at employer expense, detect early symptoms of exposure to potential health hazards in the work environment, and minimize possible compliance problems if an employee does not detect or report such symptoms.

MANAGEMENT TECHNIQUES YOU CAN USE TO ENCOURAGE REPORTING

There are several management techniques you can use to encourage reporting of accidents, exposure to health hazards, and near-misses, by the employees you supervise. These techniques are:

- Praise - complimenting employees when they have done a good job.
- Training - teaching employees what is expected of them and how to do it.
- Repetition - telling employees over and over again what is expected of them.

ANSWERS TO QUESTIONS:

11. a. It is part of your legitimate concern over the welfare of a fellow human for you to be responsible for teaching them what they're up against. As a supervisor, you are responsible for all kinds of things concerning the welfare of employees, and making sure they understand these kinds of potential problems is clearly a regular part of any good supervisor's job.

- Constructive Criticism - pointing out to employees what they have done wrong and how to correct it.
- Setting a Good Example - following the rules and doing things correctly yourself.

APPLICATIONS

12. The names of the management techniques are listed in Column A. Specific applications of the techniques to get accidents, exposures to health hazards, and near-misses reported are listed in Column B. Match the name of each technique in Column A with the specific application of the technique described in Column B.

A		B
a. Praise	____	i. Train new and old employees to report all accidents, exposures to health hazards, and near-misses; to recognize symptoms of job-related illnesses resulting from health hazards to which they may be exposed and teach them to report regularly for whatever tests are necessary to detect early symptoms.
b. Training	____	
c. Repetition	____	
d. Constructive Criticism	____	
e. Setting a Good Example	____	ii. Repeat at each safety and health meeting that it is important to report all accidents, exposures to health hazards, and near-misses.
		iii. At the time an accident, exposure to a health hazard, or near-miss is reported, tell the employee who does the reporting that you are pleased that the report has been made.
		iv. Show that you think reporting is important by taking immediate action on each report.
		v. Tell employees you are dissatisfied when you learn of the failure to report an accident, exposure to a health hazard, or near-miss.

ANSWERS TO QUESTIONS

12. a. iii. b. i. c. ii.
d. v. e. iv.

TAKING ACTION

13. If you demonstrate that you think reporting of accidents, exposures to health hazards, and near-misses is important by _____ on each report, your employees are more likely to continue reporting them.

a. taking no action

b. taking slow action

c. taking immediate action

THE INVESTIGATION

A FACT-FINDING JOB

Investigating an accident, an exposure to a health hazard, or a near-miss is a fact-finding job. The best person to conduct such an investigation is the person who knows the most about the employees, machines, materials, procedures, and job environment involved. You are the best person to investigate because:

- you have daily contact with employees, machines, materials, and work environment involved;
- you are familiar with the procedures in your work area;
- you are in direct control of the employees, procedures, and property in your workplace and can take immediate corrective action;
- you can follow up corrective action taken;
- you can communicate more effectively with employees.

INVESTIGATE IN ORDER TO PREVENT

The purpose of investigating an accident, an exposure to a health hazard, or a near-miss, is PREVENTION. During the investigation you must get all the facts necessary to determine the immediate and basic causes of the events so that effective preventive action can be taken. Steps in collecting this information include: 1) inspecting the scene of the accident or exposure to a health hazard, 2) interviewing the employee or employees involved and any witnesses, and 3) having the event reenacted if necessary. Lesson 7 will tell you how to conduct a facility inspection. The technique of interviewing employees and having an event reenacted will be discussed later in this lesson.

ANSWERS TO QUESTIONS

13. c.

HAVE YOU ACCOMPLISHED THE PURPOSE?

Suppose that an employee was running down the aisle in your workplace carrying several packages. The employee stumbled over a cable in the walkway and sprained an ankle. You investigate the accident and try to find out what caused it. You determine that: 1) the employee was running, 2) the packages were partly blocking the employee's view, and 3) the cable was obstructing the passageway.

14. If you end your investigation at this point, have you accomplished the purpose of the investigation?

    a. Yes

    b. No

FOLLOW-UP

If you follow up your investigation by making arrangements to have the cable rerouted away from the passageway; and, if at your next safety and health meeting you remind employees that running and carrying things that obstruct their view really can result in their getting hurt, you have taken action intended to prevent a similar accident from occurring again.

Here is another example. Supervisor A works in an explosives plant. A new employee reports she repeatedly has had severe headaches since coming to work in this job. As a result of previous experience in the plant, Supervisor A knows that nitroglycerin can be absorbed through the skin and cause such headaches. Supervisor A conducts an investigation. One of the items she checks is whether the employee is wearing protective gloves when handling the nitroglycerin. She discovers that the employee IS wearing protective gloves, but that the gloves are the wrong kind. The employee has erroneously been issued gloves that are made of a material that absorbs nitroglycerin and allows it to come in contact with the skin. If Supervisor A ends her investigation at this point, she has not accomplished the purpose of the investigation because no action has been taken to prevent the same thing from continuing to happen.

15. Which of the following actions should Supervisor A take to prevent the exposure to the health hazard from continuing to happen?

    a. See that the employee is issued the correct type of nonabsorbent gloves.

    b. Find out how the error occurred in the supply room and get the cause of that error corrected.

    c. Include in training for new employees information describing proper protective equipment so that they can verify that they are provided with the correct type of protective gloves and other equipment.

In addition to preventing future injuries, health damage, disability, and death, you benefit from making a thorough investigation and taking effective corrective action in several ways. One benefit is that productive time lost in your work area because of recurring injuries or illnesses is likely to be reduced.

Another benefit is that it gives your employees concrete evidence that you are concerned about their well-being.

ANSWERS TO QUESTIONS:

14. b. No. Because no steps have been taken to prevent such an incident from happening again.

15. a., b., c.

EFFECTIVE INVESTIGATION

Effective investigation and preventive action gives top management concrete evidence that you are a competent and concerned supervisor. Good investigation and corrective measures are the mark of a supervisor who is in control of the situation in the workplace.

WHICH IS BETTER?

16. An accident occurred in Supervisor A's workplace, and an exposure to a health hazard occurred in Supervisor B's workplace. Each supervisor conducted an investigation. The situation in each workplace, after the investigation, is described below. Which supervisor conducted the better investigation?

Supervisor A

- There has been no reduction in the amount of time lost due to recurring accidents in the supervisor's work area.
- The employees have no evidence of their supervisor's concern for them.
- Top management is not especially impressed with the supervisor's competence.
- There has been no demonstration that the supervisor is in control of the situation in the work area.

Supervisor B

- Lost time in the supervisor's workplace due to recurring occupational illnesses has been reduced.
- The employees believe that the supervisor is concerned about their well-being.
- Top management thinks the supervisor is competent.
- The supervisor demonatrated control of the situation in the work area.

INVESTIGATE PROMPTLY

The best time to investigate an accident, exposure to a health hazard, or near-miss, is as soon as possible. The shorter the time lapse between the incident and the investigation, the clearer the details will be in employees' minds, the more will be remembered, and the more likely you are to be able to find out what caused the incident.

ANSWERS TO QUESTIONS:

16. Supervisor B

REASONS FOR DELAY

The only situations that should be permitted to delay investigation are those involving the physical or emotional well-being of the employees.

17. According to this statement, are the situations below legitimate reasons to delay an investigation?

	Yes	*No*
a. when an employee needs medical treatment	—	—
b. when an employee is very emotionally upset	—	—
c. when the production schedule will be interrupted	—	—
d. when it will cause extra work for the supervisor	—	—
e. when the witnesses will have to be away	—	—
f. when work at the location of the incident will have to be curtailed	—	—

GOOD INTERVIEWING TECHNIQUE

One step in an investigation is to interview the employee who was injured or made sick. An important part of good interviewing technique is to put the person being interviewed at ease. The interview techniques of two supervisors are described below.

18. Which supervisor is more likely to have made the employee feel at ease?

Supervisor I

- Explained that the only purpose of the investigation and interview was to find out what happened in order to prevent recurrence.
- Told the employee that recurrence could not be prevented without the employee's help.
- Said that the interview was a joint effort to prevent similar incidents with even more serious consequences.
- Was friendly and understanding.

Supervisor II

- Said the intention of the investigation was to find out who was at fault.
- Said the purpose of the interview was to find out what had been done wrong.
- Said the incident must have occurred because someone had made a mistake, used poor judgment, been careless, or broken the rules, and the intention of the investigation was to find out who.
- Cross-examined the employee.

ANSWERS TO QUESTIONS:

17. a., b., Yes. c., d., e., f., No.

18. Supervisor I clearly did the better interviewing job.

One way to put the employee being interviewed at ease is to make the interview private.

19. In addition to being helpful in putting the employee at ease, other reasons for conducting the interview in private are:

    a. To keep the person being interviewed from being influenced by the opinions of others.

    b. To avoid embarrassing the employee over statements concerning fellow employees' roles in the incident.

Ask the employee being interviewed to describe to you exactly what happened. Don't interrupt. Save your questions until the end of the description.

20. Two supervisors' interview techniques are described below. Which supervisor is more likely to get the most complete and accurate information?

Supervisor I	*Supervisor II*
• Said what was wanted was the employee's description of the incident exactly as it happened.	• Said the employee was not to dress up the story for the supervisor's benefit.
• As the employee described what had happened, said only things like "What happened next?" and "And then what happened?"	• Interrupted the employee to clarify ("Are you saying that . . .?)
• Waited until the employee finished the description, and then asked questions.	• Interrupted the employee to interpret ("In other words you mean . . .?)
• Made no judgmental remarks about what was right or who was at fault.	• Made evaluating remarks ("Well now, in my opinion . . .")
	• Made judgmental remarks ("That was silly!")

REPEAT WHAT WAS SAID

It is important to get an accurate account of the incident in detail. When the employee being interviewed has finished describing the incident, you should repeat back to the employee in detail exactly what you understand to have been said, so the employee can correct what was said or your understanding of it, as necessary.

ANSWERS TO QUESTIONS:

19. a. and b.

20. Supervisor I.

A POSITIVE ENDING

Close the interview on a positive note: discuss PREVENTION. This can best be done by discussing actions that can be taken to prevent a similar incident from occurring again.

21. When you close an interview by discussing actions that can be taken to prevent a similar incident from occurring, which one of the following is your reason for doing this?

    a. To make the employee feel guilty.

    b. To cause the employee to worry about a blemish on his or her personnel record.

    c. To reaffirm in the employee's mind that the purpose of the interview is prevention.

    d. To make the employee decide not to tell anyone else what really happened.

INTERVIEWING TECHNIQUES FOR WITNESSES

WITNESSES IN AN INVESTIGATION

A witness in an accident or hazardous exposure investigation can be either a person who saw the incident which resulted in injury or illness, or a person who has personal knowledge about the situation in which the incident occurred.

THE SAME TECHNIQUE

Use the same interview technique with witnesses as with the employee who was injured or made ill. This means you should conduct the interview as soon as possible. When you are interviewing, try to put the witness at ease.

If you have any questions about the witness's account of the incident, wait until the witness finishes describing what happened before you ask questions. When the witness finishes telling you what happened, repeat exactly what you understand the witness to have said so it can be corrected, if necessary. End the interview with the witness by: discussing ways to prevent another such incident.

REENACTMENT

AVOID A RECURRENCE

Sometimes it is helpful, in the course of an investigation, to see the precipitating incident acted out. This is called REENACTMENT. If you decide to have an incident reenacted, take care not to be too realistic. You do not want another injury or illness. To avoid another real incident, be sure the employee who is going to reenact the incident understands that the idea is to simulate what was done before. Have the employee move in SLOW MOTION. This is another way to keep the reenactment from causing another injury or illness.

ANSWERS TO QUESTIONS:

21. c.

The employee who is going to act out the precipitating event should not be emotionally upset. Make sure the employee is calm about doing the reenactment.

TWO REENACTMENTS

22. Supervisors A and B are going to stage reenactments of events which resulted in injuries or illnesses in their work areas. Which one is less likely to have the reenactment result in another injury or illness?

Supervisor I

- Tells the employee to be as realistic as possible.
- Tells the employee to move at normal speed.
- Tells the employee to act just as before because the reenactment will be beneficial.

Supervisor II

- Tells the employee to be careful to simulate what occurred previously but not to actually repeat it.
- Tells the employee to move in slow motion.
- Makes sure the employee is not upset.

THE INVESTIGATION REPORT

An investigation of an event such as an accident, an exposure to a health hazard, or a near-miss is sometimes confused with the REPORT of the investigation. Actually, of course, conducting the investigation and preparing the report are two different activities.

The process of collecting the facts about an event resulting in injury, illness, death, or property damage is an INVESTIGATION.

The written record of the findings of an investigation of an accident, exposure to a health hazard, or near-miss constitutes an INVESTIGATION REPORT.

EXAMPLE

Suppose that one of the employees you supervise has an accident or is exposed to a health hazard on the job. First, you would get any necessary medical attention for the employee and notify the appropriate people in your organization of the event. Then you would investigate the incident. Finally, you would prepare a written report of the investigation.

ANSWERS TO QUESTIONS:

22. Supervisor II

THE PROPER SEQUENCE OF INVESTIGATING AND REPORTING

23. Arrange the following steps in the proper sequence:

a. An employee has an accident or is exposed to a health hazard in the workplace. ____

b. You get any necessary medical attention for the employee and notify appropriate personnel that the incident has occurred. ____

c. You prepare an investigation report. ____

d. You conduct an investigation of the incident. ____

AN ADDITIONAL BENEFIT

In addition to providing information to aid in injury and illness prevention and control, an investigation report indicates how well you performed the job of investigating the accident or exposure to a health hazard. Your performance as a supervisor will be evaluated by top management partially on the basis of your REPORT of the investigation. This is an additional reason to submit an investigation report promptly in writing.

THE BASIC INFORMATION IN A REPORT

A sample of a supervisor's investigation report appears on page 42. When completed, this report will contain the following information needed to prepare the reports and records required by the regulations promulgated under the Act, discussed in Lesson 3.

- An identification of the employee who was involved.
- A description of the injury or illness.
- A description of how the accident or exposure to health hazard occurred.
- An analysis of how the accident or exposure occured.

The investigation report that you prepare for your employer should contain the same information.

MUST ACT TO ELIMINATE HAZARD

The sample supervisor's investigation report on page 42 also contains a description of ACTIONS TAKEN and ACTIONS RECOMMENDED to prevent the event from occurring again. The investigation report you prepare for your employer should contain the same kind of information. THIS IS ESPECIALLY IMPORTANT IF YOUR INVESTIGATION HAS REVEALED THAT A VIOLATION OF THE OSHA SAFETY AND HEALTH STANDARDS WAS INVOLVED in the accident or exposure to a health hazard, because action to eliminate the violation is necessary in order to be in compliance with the law.

SUPERVISOR'S INVESTIGATION REPORT

Company _____ Department _____

Exact location of event _____ Date and time of event _____

EMPLOYEE IDENTIFICATION

Name _____ Occupation _____

Nature of injury or illness _____

Object/equipment/substance which inflicted injury or caused illness _____

Person with most control of object/equipment/substance _____

DESCRIPTION OF EVENT

(Describe in detail what occurred and how the event occurred)

_____

_____

ANALYSIS OF CAUSES

Immediate causes (What hazardous acts and/or hazardous conditions contributed most directly to the event)

_____

Basic causes (What are the basic causes for the existence of these hazardous acts or conditions)

_____

_____

PREVENTIVE ACTION

(What action has, or will be taken to prevent recurrence)

_____

_____

LOSS SEVERITY POTENTIAL			PROBABLE RECURRENCE RATE		
Major	Serious	Minor	Frequent	Occasional	Rare
___	___	___	___	___	___

Investigated by _____ Date _____

ANSWERS TO QUESTIONS

23. a. Step 1 b. Step 2 c. Step 4 d. Step 3

A SAMPLE REPORT

Some information from a sample supervisor's investigation report appears below. Please read it and then answer the questions.

SUPERVISOR'S INVESTIGATION REPORT

Company: The American Company

Department: Shipping

Exact Location of Event: Bldg. A, south side, west loading dock

Date and Time of Event: March 7 at 2:45 p.m.

Employee's Name: Employee A

Employee's Occupation
or Job Title: Lift truck operator

Description: Employee A was backing an emply lift truck (#26) north along dock to clear space in order for loaded lift truck (#22) to pass.

24. Who was the employee involved in the incident? _____

25. When did it happen? _____

26. Where did it happen? _____

THE LOCATION IS IMPORTANT

Note that the location of the incident is described in detail. Knowing the exact area where the event occurred is important in determining what caused the incident, because the causes of such incidents are frequently related to the location.

ANSWERS TO QUESTIONS

24. Employee A

25. March 7 at 2:45 p.m.

26. Building A, south side, west loading dock

OCCUPATION AND WORK BEING DONE

In preparing an investigation report, it is necessary to distinguish between the occupation or job title of the employee and the work the employee was performing when the event being investigated occurred.

27. From the sample report, page 43,

    a. What is the employee's occupation or job title?

    _____

    b. What work was the employee doing when the incident occurred?

    _____

OCCUPATION OR JOB TITLE

In your company, an employee's occupation or job title may be called a "position title" or an "employee classification" or various other names. An employee's occupation or job title usually appears on his or her personnel record, time card, or payroll record.

EXAMPLE

Employee is a pipefitter. Employee was using a hacksaw to cut out a section of a pipeline which had been used to carry a caustic chemical. The pipeline had been drained for maintenance. However, because the pipe had been partially plugged, some of the caustic chemical was trapped inside the pipe and got onto the employee's skin during the cutting operation.

28. "Pipefitter" is employee's _____.

29. Using a hacksaw to cut out a section of pipeline is _____
    _____.

ANSWERS TO QUESTIONS:

27. a. lift truck operator
    b. backing lift truck north to clear aisleway

28. Occupation or job title

29. The work the employee was doing at the time he was exposed to the health hazard.

WHAT AND WHO?

In determining what caused an injury or illness, it is important to find out:

- What object, equipment, or substance inflicted the injury or caused the illness.
- Which person had the most control of the object, equipment, or substance.

30. Read the information from the supervisor's investigation report below and answer the questions:

SUPERVISOR'S INVESTIGATION REPORT

Employee's Name: Employee

Injured part of body: Right arm

Nature of injury or illness: Fracture of upper right arm

Object/equipment/substance inflicting injury or causing illness: Lift truck

Person with control of object/equipment/substance: Employee

a. What inflicted the injury? _____

b. Who had the most control over what inflicted the injury? _____

ANSWERS TO QUESTIONS:

30. a. the lift truck b. employee

WHAT DID IT?

31. Pick out the object, equipment, or substance that inflicted the actual injury or caused the illness in the examples below:

    a. A bolt fell from an overhead crane and struck and injured a hook-up man.

    b. A pipe wrench with dulled jaws slipped and caused a plumber to break a finger.

    c. Toxic gas from a leak in a storage tank nauseated a group of 40 employees.

    d. A chemical in a pump being repaired in the maintenance shop caused a repairman to develop dermatitis.

    e. An adding machine tipped off a stand and broke a clerk's foot.

WHO HAD THE MOST CONTROL?

32. Pick out the person who had the most control over the object, equipment, or substance that inflicted the injury or caused the illness in the examples below:

    a. An electrician was repairing an overhead crane when a bolt he had loosened fell from the crane and struck and injured a hook-up man below.

    b. A plumber was tightening a pipe connection when the pipe wrench he was using slipped and broke his finger.

    c. A pipefitter had just installed a valve when toxic gas leaked from it and nauseated 40 nearby employees.

    d. An engineer disconnected a pump to be repaired did not decontaminate it or label it as contaminated and the caustic chemical residue in the pump caused the repairman to develop dermatitis.

    e. A clerk was pulling an addition machine on a stand down as aisle when the machine tipped off the stand and broke the employee's foot.

ANSWERS TO QUESTIONS

31. a. bolt b. pipe wrench c. toxic gas d. chemical
e. adding machine

32. a. electrician b. plumber c. pipefitter d. engineer
e. clerk

LEARN CAUSES TO PREVENT RECURRENCES

As was discussed in Lesson 4, it is necessary to find out the immediate and basic causes of an injury or illness in order to prevent a recurrence. Experience has shown that certain common kinds of hazardous acts and hazardous conditions are the immediate causes of the majority of accidents and exposures to health hazards on the job.

33. Would knowing what common hazardous acts and hazardous conditions to look for assist you in collecting pertinent facts and analyzing the information you have collected?

    a. Yes

    b. No

A CLASSIFICATION SYSTEM

The American National Standards Institute (ANSI), a nonprofit private standards-producing organization, has developed a widely used system for classifying kinds of accidents and exposures to health hazards, and a system for classifying the causes of these events. The Institute's publication *Z16.2*, "Classifying Accident Causes" can be obtained by writing ANSI at the address given in Lesson 14. This would be a very useful publication for you to get and keep at your workplace.

DESCRIPTION AND ANALYSIS

The information contained in the description and analysis sections of a supervisor's investigation report appears below. Read this information and then answer the questions in the following item.

SUPERVISOR'S INVESTIGATION REPORT (SAMPLE)

DESCRIPTION:

Employee A was backing an empty lift truck (#26) north along dock to clear space in order for loaded lift truck (#22) (headed east toward trailer at dock) to pass. He backed into bumping block at fast speed. Block broke off dock allowing his truck to continue backward and topple off dock to ground 6 feet below on north side of dock. Lift truck landed on side. Employee A jumped clear of the truck just as it backed off the platform. He hit his elbow on some part of the truck as he attempted to jump free. He landed right beside the truck on the ground 6 feet below dock. He had the wind knocked out of him and suffered a broken right arm.

ANSWERS TO QUESTIONS:

33. a.

ANALYSIS: The hazardous acts, failures to act and/or conditions contributing most directly to this event:

1. Employee X had reported "defective brake" on lift truck #26 at end of night shift two days before, on operator's report form.
2. Employee A removed truck from garage and operated it from 11:00 AM although he had noticed it had a defective brake when in reverse. He was deliberately using bumping block on platform as stopping mechanism for truck.
3. The bumping block on the dock was generally known to be in unsafe condition. Condition of block was reported as wobbly and cracked on inspection reports of January 5 and February 20 by both Supervisors "L" & "M."

ANALYSIS: The basic reasons for the existence of this hazardous act and/or condition:

1. Employee A was not properly trained, motivated, or supervised.
2. Garage supervisor and garage personnel did not properly follow up condition on operator's report form.
3. Building maintenance supervisor and personnel failed to effect prompt corrective action to bumper block.
4. Area supervisor failed to properly follow up unsafe bumper condition.

HAZARDOUS ACTS LIST

As a matter of fact, the hazardous acts that commonly cause accidents and exposures to health hazards in the workplace are so well known that it is possible to prepare a simple list that will cover a majority of the situations you will encounter:

- operating without authority
- operating or working at unsafe speed
- making safety devices inoperative
- using unsafe equipment
- loading or mixing in unsafe manner
- taking unsafe position
- working on moving or dangerous equipment
- distracting co-workers or being distracted
- failing to use proper clothing

AN EXAMPLE

From the description and analysis of Employee A's accident in the sample Supervisor's Investigation Report, it is clear that one cause of the accident was the fact that he was using a lift truck with defective brakes.

34. Which of the hazardous acts just listed is this?

HAZARDOUS CONDITIONS

Some of the kinds of hazardous conditions that commonly cause accidents and exposures to health hazards in the workplace are:

- improperly guarded equipment
- defective facility
- hazardous arrangement
- improper illumination
- improper ventilation
- unsafe dress or apparel
- inadequate maintenance
- improper labelling, transport or storage of hazardous substances
- excessively high noise level
- extreme heat, cold, humidity or dryness
- excessive vibration

ANOTHER EXAMPLE

From the description and analysis of Employee A's accident in above item, it is clear that one cause of the accident was the unsafe condition of the bumping block on the loading dock.

35. Which of the hazardous conditions listed in above list is this?

OTHER STRESSES

Other types of stresses which are suspected of contributing to accidents and injuries but which are not so well documented are:

- heavy responsibility
- rapid working speed
- high volume output requirements
- combination of many complex steps
- emotional stress
- monotony

PREVENTION

The prevention portion of a supervisor's investigation report appears below.

36. Has the supervisor taken all the actions necessary to prevent recurrence of the events described in the Supervisor's Investigation Report, page 47?

    a. Yes

    b. No

ANSWERS TO QUESTIONS:

34. Using unsafe equipment

35. Defective facility and inadequate maintenance

36. a. Yes

SUPERVISOR'S INVESTIGATION REPORT

PREVENTION: What action has been, or will be, taken to prevent recurrence?

1. Personnel department has been requested to assist in establishing lift truck operator training course.
2. Lift truck working rules will be reviewed with all operators at next safety and health meeting.
3. All lift truck operators will be included in both programs 1 and 2 as soon as possible.
4. Maintenance control has issued a hazard classification coding system it wants everybody to use on all safety work orders.
5. All operators have been vigorously instructed that under no circumstances do they have to operate equipment considered to be unsafe in any way. They were told they can always leave it in the shop until it is fixed.
6. A follow-up system for checking up on inspection report items is being developed by a committee headed by Supervisor L. He expects to have the system ready to discuss with fro t office in one week.
7. The lift truck and bumper block involved in the accident have been repaired.
8. Procedures for periodic inspection of lift trucks have been set up.

LOSS SEVERITY POTENTIAL

COULD IT HAVE BEEN WORSE?

37. In the accident described on page 46 in which the lift truck operator broke his arm, did you think the results (i.e., the broken arm, damaged lift truck, lost time, and damaged loading dock) were:

    a. About what you would expect

    b. Could have been worse

    c. Were unusually severe

VALUABLE INFORMATION

Question 37 asked you to make a judgment as to HOW SEVERE THE INCIDENT COULD HAVE BEEN. This kind of judgment is a valuable piece of information in an investigation of an accident, an exposure to a health hazard, or a near-miss.

ANSWERS TO QUESTIONS:

37. This question asks for your opinion, so there is no one right answer. However, it was a close shave and although it wasn't too bad this time the consequences could have been much worse. People have been killed this way, and Employee A was just plain lucky to have gotten off so easily.

---

38. Should you pass this valuable information on to higher management?

    a. Yes

    b. No

EXPEDITE CORRECTIVE ACTION

Your judgment as to HOW SEVERE THE INCIDENT COULD HAVE BEEN can help your employer decide what priority to give to corrective action. If another similar incident is likely to have major or serious consequences, top priority should be given to preventive action. If the consequences of another similar incident are likely to be minor, preventive action can be given normal priority.

39. Indicate which corrective action described in Column A should be given which priority listed in Column B.

A	*B*
a. Corrective action to prevent an incident that is likely to have major or serious consequences.	• Normal priority. • Top priority.
b. Corrective action to prevent an incident that is likely to have minor consequences.	

LOSS SEVERITY POTENTIAL

A judgment of how severe a future incident is likely to be has a name. It is called LOSS SEVERITY POTENTIAL. LOSS SEVERITY POTENTIAL is a way of communicating to your employer how bad the possible loss from another similar incident could be. By giving your employer this information before a similar event can occur, it will encourage the taking of preventive action.

ANSWERS TO QUESTIONS:

38. a. Yes, by all means! This incident showed up a whole group of serious problems about training, employee attitudes toward safety, lack of an organized management system to follow up on reports, and other such things.

39. a. Top priority b. Normal priority

THREE CATEGORIES OF LOSS SEVERITY POTENTIAL

The supervisor who investigated the accident described on page 46, in which the lift truck operato broke his arm, gave the incident the LOSS SEVERITY POTENTIAL rating shown below.

SUPERVISOR'S INVESTIGATION REPORT

LOSS SEVERITY POTENTIAL

☒ Major ☐ Serious ☐ Minor

40. What three categories of LO' SEVERITY POTENTIAL did the supervisor have to choose from?

_____ _____ _____ ___

41. Did the supervisor give the incident the most severe LOSS SEVERITY POTENTIAL rating?

a. Yes b. No

42. What LOSS SEVERITY POTENTIAL rating is the least severe?

PROBABLE RECURRENCE RATE

COULD IT HAPPEN AGAIN?

43. How often do you think an accident like the one described on page 46 might occur?

a. Frequently

b. Occasionally

c. Rarely

ANSWERS TO QUESTIONS:

40. Major, Serious, Minor

41. a. Yes

42. Minor

43. This item asks for your opinion so it has no one right answer. You would need more background information than you have been given here before you could make an accurate judgment. The point being made is that you would have enough information about an incident in your own workplace to make such a judgment.

ANOTHER VALUABLE JUDGMENT

Question 43 asked you to make a judgment as to HOW OFTEN SUCH AN INCIDENT MIGHT OCCUR. This kind of judgment is a valuable piece of information in an investigation of an accident, an exposure to a health hazard, or a near-miss.

44. Should you pass this valuable information on to higher management?

    a. Yes

    b. No

PROBABLE RECURRENCE RATE

Your judgment as to HOW OFTEN SUCH AN INCIDENT MIGHT OCCUR is information that can help higher management decide what priority to give to corrective action. A judgment of how often an incident might occur has a name. It is called the PROBABLE RECURRENCE RATE. PROBABLE RECURRENCE RATE is a way of communicating to higher management how much time they have before a similar incident may happen again. By giving your employer this information before a similar event can occur, it will encourage the taking of preventive action.

THREE CATEGORIES

The supervisor who investigated the accident described on page 46, in which the lift truck operator broke his arm, gave the incident the PROBABLE RECURRENCE RATE shown below.

SUPERVISOR'S INVESTIGATION REPORT

PROBABLE RECURRENCE RATE

☐ Frequent ☐ Occasional ☒ Rare

45. What three categories of PROBABLE RECURRENCE RATE did the supervisor have to choose from?

_____ _____ _____

ANSWERS TO QUESTIONS:

44. a. Yes, of course. Some kind of estimate of the frequency would be necessary in order to help decide how much company resources to devote to fixing the problem. If it is not likely to recur (and isn't serious) then the company would not be justified in spending much time and money on the problem. On the other hand, if it is likely to happen often (or if it happened only rarely, but was very serious when it did occur) then the company would certainly want to take immediate action.

45. Frequent, Occasional, Rare

---

46. Did the supervisor choose the rating given to events likely to happen most often?

    a. Yes.

    b. No

47. Which is the rating given to events likely to happen least often?

A RATING

48. A rating of how frequently an accident, an exposure to a health hazard, or a near-miss is likely to occur is called a _____ RATE.

PRIORITIES

There are several kinds of priority that an employer can give to action to prevent recurrence of an accident or exposure to a health hazard. EMERGENCY PRIORITY is given to action that must be taken immediately to prevent recurrence of an incident that is likely to have MAJOR consequences and is likely to happen FREQUENTLY.

EMERGENCY PRIORITY

49. A supervisor can use a combination of the two ratings, LOSS SEVERITY POTENTIAL and PROBABLE RECURRENCE RATE, to communicate to the employer the real magnitude of an accident, exposure to a health hazard, or near-miss. For example, if a supervisor gives an incident a LOSS SEVERITY POTENTIAL rating of "MAJOR" and a PROBABLE RECURRENCE RATE of "FREQUENT," the supervisor is communicating to the employer that corrective action should receive _____ priority.

ANSWERS TO QUESTIONS:

46. a. Yes

47. Rare

48. Probable Recurrence

49. a. High. The supervisor believes something serious is going to happen often and wants the employer to take corrective action at once. Actually an "emergency" priority and a "high" priority both indicate the need for immediate corrective action. The difference is that an emergency situation indicates that necessary action needs to be taken at once no matter how it affects normal operation.

NORMAL PRIORITY

NORMAL PRIORITY is given to action that must be taken in order to prevent recurrence of an incident likely to have MINOR consequences and likely to happen OCCASIONALLY. This means that if a supervisor gives an incident a LOSS SEVERITY POTENTIAL rating of "MINOR" and a PROBABLE RECURRENCE RATE of "OCCASIONAL," the supervisor is communicating to the employer that corrective action can receive normal priority. The supervisor believes a similar event with potentially minor consequences is likely to occur now and then. Since neither the consequences of any event nor its frequency can be predicted with complete accuracy, the supervisor wants the hazard eliminated.

DEFINITIONS

50. Match each term in Column A with its definition in Column B.

A	*B*
a. A rating of how severe an incident could be.	• Probable recurrence rate
b. A rating of how often an incident might occur.	• Loss severity potential

51. In your own words: Why are LOSS SEVERITY POTENTIAL and PROBABLE RECURRENCE RATE especially helpful?

_____

_____

_____

ANSWERS TO QUESTIONS

50. a. Loss severity potential b. Probable recurrence rate

51. They can be used together to establish a priority for preventive and corrective action.

SUMMARY

In your unique position as supervisor, you should investigate the accidents and exposures to health hazards that occur in your workplace. You also have special qualifications and advantages as an investigator because you know the most about the situation and you can take the most immediate action to prevent recurrences. As a supervisor you receive extra benefits from prompt and thorough investigative and preventive action because these actions minimize lost time in your workplace due to recurring injuries and illnesses and present tangible evidence of your ability, efficiency, concern for the well-being of the employees you supervise, and control of the situation in your workplace.

In this lesson you have learned how to encourage employees to report accidents, exposures to health hazards, and near-misses, and how to conduct an investigation of these events once they are reported. Techniques for interviewing employees involved in accidents and exposures to health hazards and for interviewing witnesses and conducting reenactments of such events were discussed. You have learned that the report of your investigation must contain a description of what happened, an analysis of the causes, and recommendations for corrective action. You have learned the usefulness of the concepts of loss severity potential and probable recurrence rate in setting priorities for corrective action. ALL OF THIS KNOWLEDGE WILL BE OF INVALUABLE ASSISTANCE TO YOU IN DISCOVERING THE CAUSES OF INJURIES AND ILLNESSES THAT OCCUR IN YOUR WORKPLACE so that you may take action to eliminate the causes and prevent recurrence.

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